Patrick MacEachen Concordia University

40209790

Soen363 – Assignment 1

2023-10-09

Q.1.

a) The ERD diagram in Chen's notation can be found in ERD diagram – Title Database file in the submitted folder

b) To show an instance where a documentary movie is self directed by a single actor, I will show the results of various tables with the filter of the given conditions

Movie Table where genre is a documentry:

Imdb_id	name	genre	length	keywords	description	plot	Release_date
1	Invented name	Documentary	200 minutes	Nature, North-pole	Scientists go to the north pole to study polar bears	they conclude that the polar bear population is in danger of extinction	2023-10-09

Dir_acts_in relationship table where imdb_id is 1:

Director_id	Role
1	Main protagonist

Director table where id is 1:

name	Date_of_birth
John Doe	2000-10-17

Acts_in table where imdb_id is 1:

actor_id	Role

Q.2.

a) The ERD diagram can be found in ERD diagram – Parking System file in the submitted folder

b)

Entities:

1. Vehicle:
    - vid: Integer, Primary Key
    - License_plate : String
    - Brand: String
    - Model: String
    - Color: String
2. Parking_spot
    - pid: Integer, Primary Key
    - Floor: Integer
    - Parking_number: Integer
    - Is_available: Boolean
3. Log
    - Vehicle_id: Integer, Primary Key & Foreign Key
    - Spot_id: Integer, Foreign Key
    - Arrival_time: DateTime
    - Departure_time: DateTime

Relationships:

1. Parcs_in: (equivalent to a log)
    - Vehicle_id: Integer, Foreign Key
    - Spot_id: Integer, Foreign Key

c)

```
CREATE TABLE Vehicle(
    vid INTEGER NOT NULL,
    license_plate VARCHAR(20),
    brand VARCHAR(20),
    model VARCHAR(20),
    color VARCHAR(20),
    PRIMARY KEY (vid)
);

CREATE TABLE Parking_spot(
    pid INTEGER,
    floor INTEGER,
    spot_number INTEGER,
    is_available BOOLEAN,
```

```
    PRIMARY KEY (pid)

);

CREATE TABLE Parcs_in(
    vehicle_id INTEGER,
    spot_id INTEGER,
    FOREIGN KEY (vehicle_id) REFERENCES Vehicle(vid)
                    ON DELETE CASCADE,
    FOREIGN KEY (spot_id) REFERENCES Parking_spot(pid)
                    ON DELETE CASCADE
);

CREATE TABLE Log(
    vehicle_id INTEGER,
    spot_id INTEGER,
    arrival_time DATETIME,
    departure_time DATETIME,
    PRIMARY KEY (vehicle_id),
    FOREIGN KEY (spot_id) REFERENCES Parking_spot(pid),
    FOREIGN KEY (vehicle_id) REFERENCES Vehicle(vid)
                                ON DELETE CASCADE
);
```

d) In the Original table instances, I have put the content of all the tables of the database to add more context to the following three instances:

1. Location that is empty and has never been occupied

Pid	floor	Spot_number	Is_available
104	1	4	1

2. Location that is currently occupied

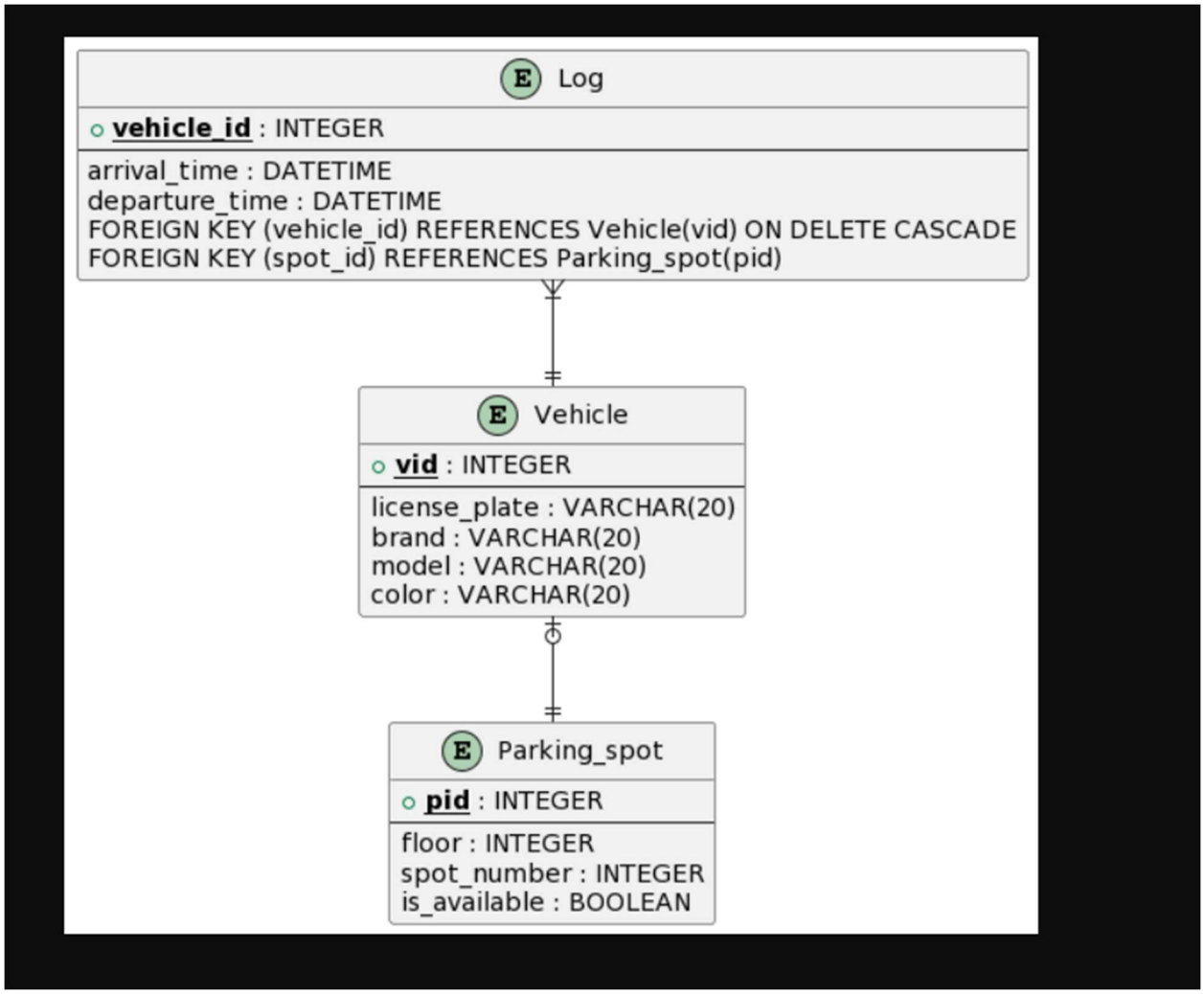
pid	floor	Spot_number	Is_available
102	1	2	0

3. Location tht is currently free but has previously been occupied

pid	floor	Spot_number	Is_available
101	1	1	1
103	1	3	1

The arity is 4 for each instance given.

Q.3.



//www.plantuml.com/plantuml/png/RP5VRu8m5CNV-HHtFcaMuhB7XH0PLaTKC9MO-DGKgQvPeQJyYSlmkuyYSLDv8UMSczDVxvda1LL5cGZZAMO7dZ9OByWQUoi7xyW2xOQd4LYHRPNsoHgNjZMExElaR45c0KRUtBzETcE6mTA25zymsB9FlXTi03I7wdA67mFW-VwUYiSZU0FF3z4SuMR2D9kFu7kMvenaWXQiiRSETZySF7nz6JLkf6WQFwY9Z9buKFTII7MddlyurrHzyVH8yamMBQm-z9DclQG78QMwaNK2ISiaOhSwpmcjA1Sq4lf9xq6mH8wlOQuqItbi8OGyzZDqgoIzA5GfNb512fxe2wPEY49lXHedPfbkMx4UhwiIcdYuoSTeXZ3oNRI1hirBMO4FKxH48GBNsRZEz254B-0-uV-UzIRR4hhRQccQTGtQClJBptNxtxd6XALncOXV